

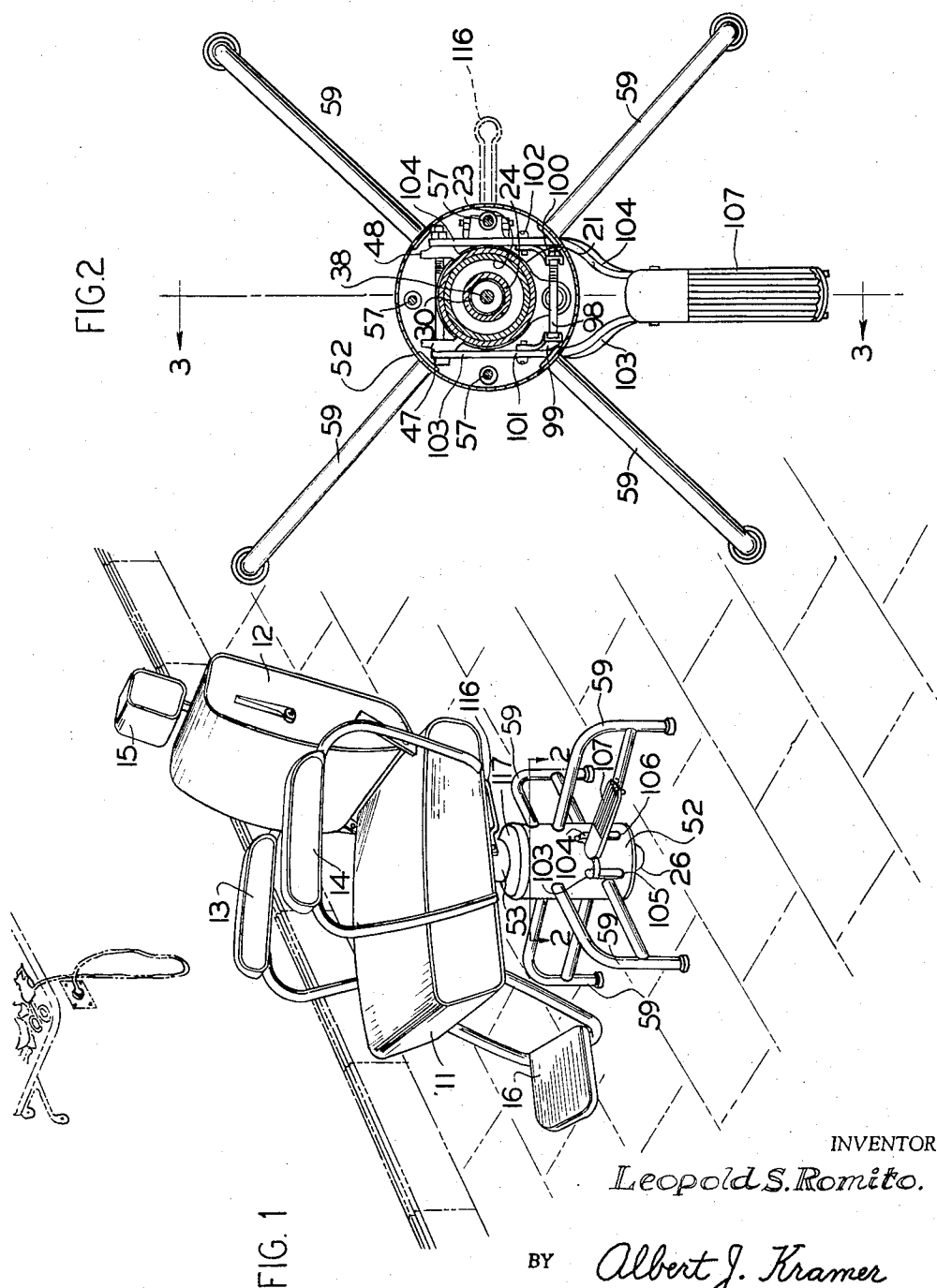
Sept. 30, 1958

L. S. ROMITO
HYDRAULIC CHAIRS

2,854,061

Filed May 9, 1955

4 Sheets-Sheet 1



INVENTOR

Leopold S. Romito.

BY

Albert J. Kramer

ATTORNEY

Sept. 30, 1958

L. S. ROMITO
HYDRAULIC CHAIRS

2,854,061

Filed May 9, 1955

4 Sheets-Sheet 2

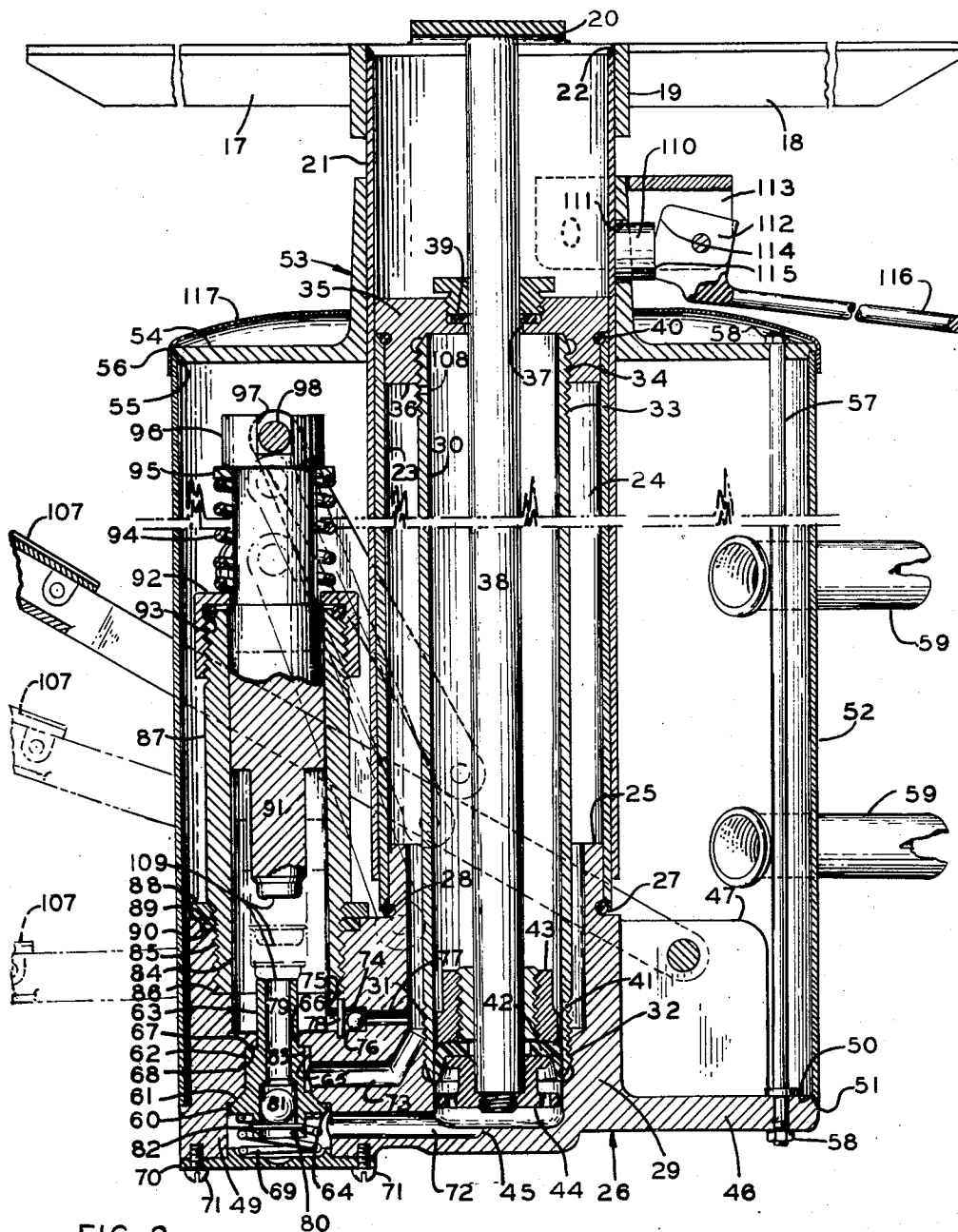


FIG. 3

INVENTOR

Leopold S. Romito

BY *Albert J. Kramer*

ATTORNEY

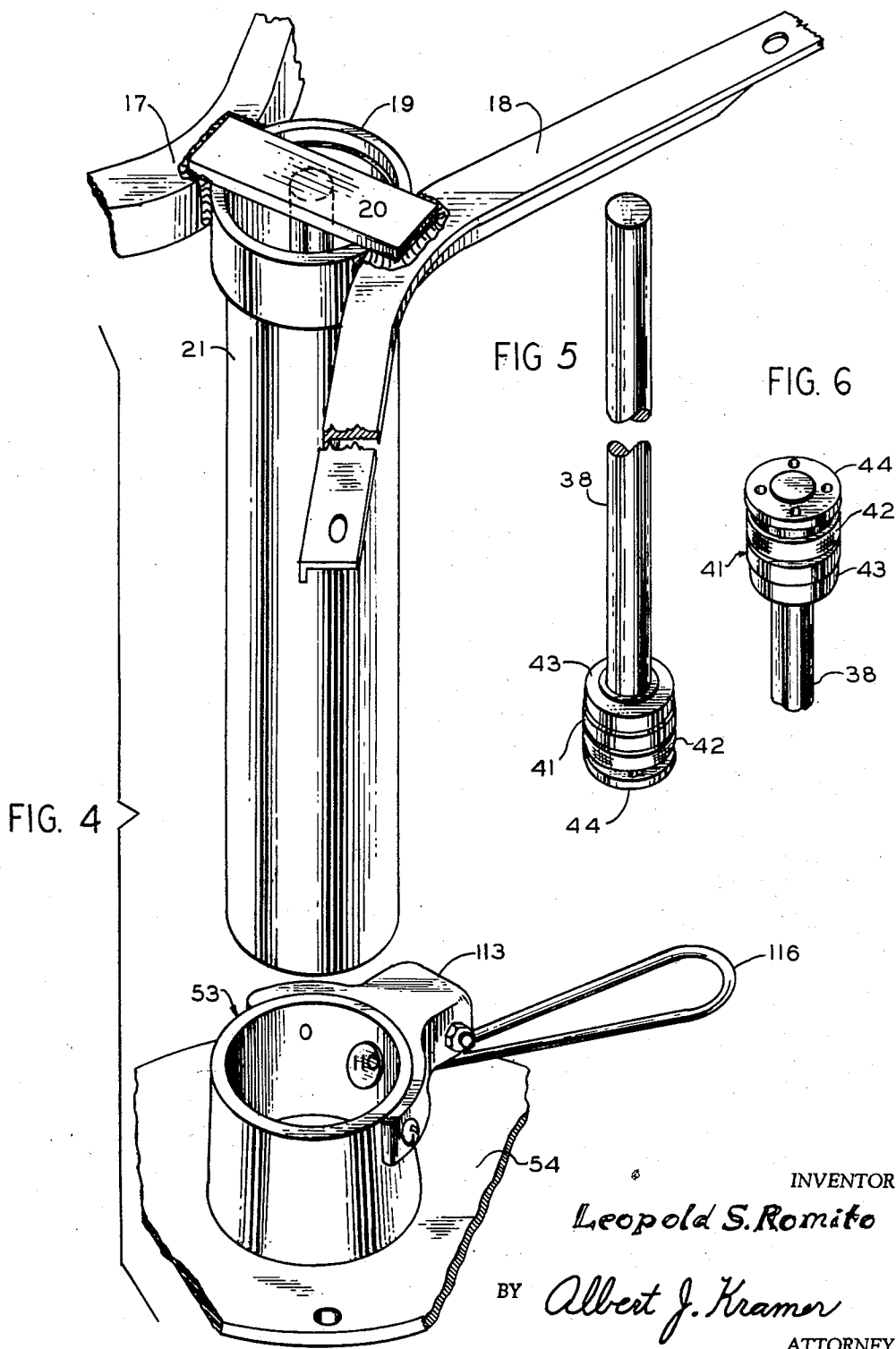
Sept. 30, 1958

L. S. ROMITO
HYDRAULIC CHAIRS

2,854,061

Filed May 9, 1955

4 Sheets-Sheet 3



INVENTOR

Leopold S. Romito

BY

Albert J. Kramer

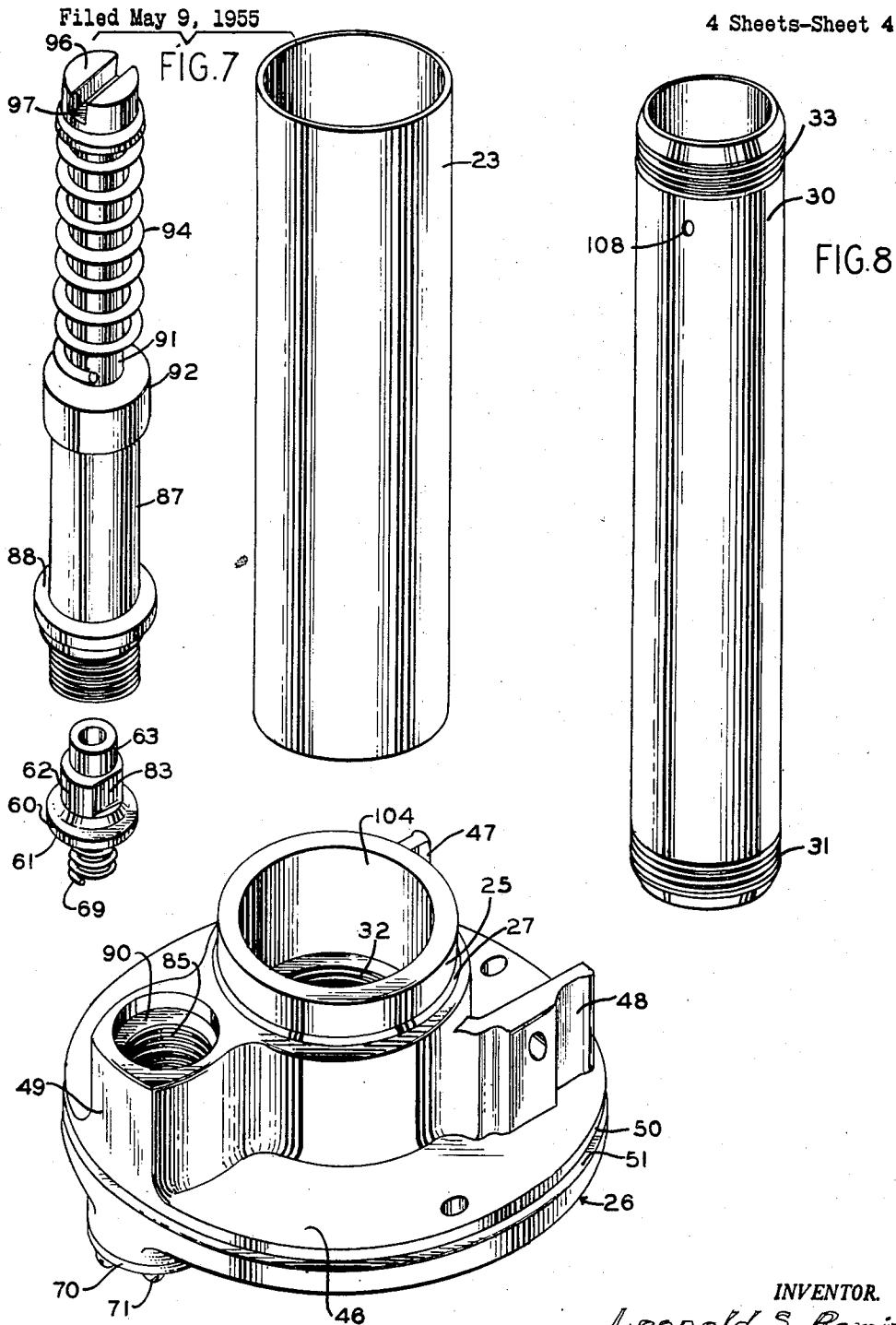
ATTORNEY

Sept. 30, 1958

L. S. ROMITO
HYDRAULIC CHAIRS

2,854,061

4 Sheets-Sheet 4



INVENTOR.
Leopold S. Romito
BY
Albert J. Kramer

1

2,854,061

HYDRAULIC CHAIRS

Leopold S. Romito, Ravenna, Ohio

Application May 9, 1955, Serial No. 506,839

3 Claims. (Cl. 155—25)

This invention relates to hydraulic chairs and is more particularly concerned with the types of hydraulic chairs which are designed for elevating and lowering a person seated thereon, such as are conventionally used by barbers, hairdressers, dentists, doctors, and others.

One of the objects of this invention is the provision of a hydraulic chair of the type mentioned which has a single control member operating in a single plane for both elevating and lowering the chair.

Another object of the invention is the provision of a chair of the type mentioned in which the seat is vertically movable by a hydraulic ram, and a novel type of valve mechanism for controlling the flow of hydraulic fluid relative to the ram cylinder and a fluid reservoir adjacent thereto.

A further object of the invention is the provision of a novel valve mechanism for a hydraulic system.

A still further object of the invention is the provision of a novel construction of a hydraulic chair of the type mentioned which facilitates the use of the chair on the part of the operator.

These and other objects and advantages of the invention will appear more fully from the following description considered together with the accompanying drawing.

In the drawing:

Fig. 1 is a perspective view of a hydraulic chair constructed in accordance with an embodiment of this invention.

Fig. 2 is a horizontal section along the line 2—2 of Fig. 1.

Fig. 3 is a vertical sectional view of the hydraulic mechanism in the plane of the line 3—3 of Fig. 2.

Fig. 4 is an exploded perspective view of the clamping device and parts associated therewith.

Fig. 5 is a perspective view of the hydraulic ram, partly broken away, and piston apart from the device as a whole.

Fig. 6 is a bottom plan view of the hydraulic piston and ram partly broken away.

Fig. 7 is an exploded perspective view of certain parts of the hydraulic mechanism.

Fig. 8 is a perspective view of the cylinder wall between the hydraulic ram and reservoir.

Referring with more particularity to the drawing in which like numerals designate like parts, the embodiment illustrated comprises a chair having a seat 11, a back rest 12, arm rests 13 and 14, a head rest 15 and a foot rest 16, all joined together to form the seat section mounted on a suitable frame structure, including bottom horizontal frame arms 17 and 18, straddling a central collar member 19 and a bar 20 bridging the two members 17 and 18 diametrically across the top of the collar 19.

The collar 19 is carried at the top of a tubular cylinder 21 to which it is firmly secured, such as welding 22.

The tubular cylinder 21 is slidably mounted on and telescopes with an interior cylinder 23 that forms the outer wall of the reservoir chamber 24 of the hydraulic system. The lower end of the cylinder 23 is press fitted

2

about a neck portion 25 of a casting 26. A rubber sealing ring 27 is set in a groove 28 and is disposed between the neck 25 and the lower edge of the cylinder 23, substantially as shown.

The neck portion 25 is an upward recessed extension of a hollow central portion 29 of the casting 26. Within said hollow portion there is disposed the lower end of a tube or cylindrical member 30 having external threads 31 at said bottom which engage internal threads 32 in said hollow portion. This member separates the reservoir chamber 24 from the ram chamber. The upper end of the tube 30 also has external threads 33 which engage the internal threads 34 of a header 35 across the top of both the cylinder 23 and tube 30. The threads 34 are provided on an annular dependent portion 36 of the header disposed between the tube 30 and the cylinder 23. The header 35 has a central aperture 37 through which the ram 38 passes and this aperture carries a gland 39. A rubber gasket 40 is disposed between the header and the cylinder 23. The upper end of the ram 38 projects upward to the bar bridge 20 and the lower end extends downwardly and has attached thereto a piston assembly 41 comprising the usual flexible piston ring 42 mounted between suitable holding members 43 and 44, substantially as shown.

The bottom of the hollow portion of the casting is closed by an end wall 45 which is integral with a surrounding circular portion 46 carrying a pair of parallel lobes 47 and 48 on one side of the portion 29 and a valve housing 49 on the opposite side thereof.

The outer edge of the circular portion 46 is rabbeted to form a recessed edge 50 and an adjacent upwardly facing shoulder 51 for the support of the lower end of a cylindrical shell 52. The upper end of the shell 52 is provided with a collar 53 surrounding the cylindrical member 21. Said collar has a horizontal annular flange 54 which is also rabbeted to provide a recessed edge 55 and a downwardly facing shoulder 56 for engaging the upper end of the shell 52.

The shell 52 is held in place between the flange 54 and the circular portion 46 by means of elongated bolts 57 (four shown) and threadedly engaging nuts 58, substantially as shown.

The shell 52 is rigidly secured to leg members 59 and hence the entire chair, including the hydraulic mechanism and chair section is supported on the legs through the shell 52.

The valve housing 49 is hollow for the reception of a vertically movable hollow sleeve 60. This sleeve has a circular base section 61, a reduced central section 62, and a still further reduced upper end section 63. The housing 49 has corresponding hollow portions to fit these sections of the sleeve 60, namely, a bottom hollow portion 64 for the base section 61, a reduced intermediate portion 65 for the central section 62, and a still further reduced portion 66 for the upper end section 63. The sleeve 60 in its uppermost position has an upwardly facing shoulder 67 of the central section formed by the reduction of the upper section, against the downwardly facing shoulder 68 of the upwardly extending edges of the upper portion 66. It is maintained in this position by a coil spring 69 set in compression against the bottom of the sleeve 60 and held in this position by a bottom plate 70 attached to the bottom of the casting 26 by screws 71.

An oil duct 72 extends laterally from the hollow portion 64 through the end wall 45 to the bottom of the ram chamber. Another duct 73 extends from the intermediate portion 65 to the bottom of the reservoir chamber 24. A third duct 74 extends from the wall 75 of an enlarged portion of the valve casing above the portion 66, to the bottom of reservoir chamber 24. The duct 74 is provided with a ball 76 and a restricted portion

77 coacting to form a check valve to provide unilateral flow of oil through the duct. A retaining pin 78 is provided for the ball 76 in the duct 74.

The sleeve 60 is hollow having an axial duct 79 with an enlarged portion 80 at the bottom containing a ball 81 and a ball retainer pin 82 beneath it.

The section 62 of the sleeve 60 has a cut out portion at 83 adjacent the duct 73 forming a passage for fluid from the duct 72 to the duct 73 when the sleeve is depressed from its normal position against the action of spring 69.

Above the wall 75 at the upper end of the valve housing 49, there is provided an enlarged annular portion 84 having internal threads 85 for the reception of the lower threaded end 86 of a vertical pump housing 87. The housing 87 has an annular flange 88 above the threaded portion which acts against a sealing ring 89 set in a recess 90 above the threads 85.

A vertical reciprocating plunger 91 is slidably mounted in the housing 87 for pumping liquid from the reservoir chamber 24 to the bottom of the ram chamber. The plunger 91 extends upwardly above the top of the pump housing 87. A header 92 surrounds the plunger 91 and is threadedly engaged with the upper end of the pump housing 87. A gasket or washer 93 is disposed between the header 92 and the upper end of the housing 87.

The plunger 91 is urged to its uppermost position by means of a heavy coil spring 94 mounted in compression between the header 92 and an annular flange 95 at the top of the plunger. The flange 95 is surmounted by a boss 96 having a diametrical slot 97 thereacross for the reception of a horizontal circular bar 98. The ends of the bar 98 are each pivotally connected to one end of a strap link 99 and 100, respectively. The other ends of these links extend diagonally downward and inward where they are pivotally connected to medial portions 101 and 102, respectively, of bars 103 and 104 forming together a foot lever. The bars 103 and 104 straddle the central casting portion 29 and have their lower inner ends pivoted to the lobes 47 and 48, respectively. The opposite ends of the bars 103 and 104 project upwardly and outwardly through slots 105 and 106, respectively, of the shell 52, and are provided on the exterior of the shell with a treadle 107.

In actual operation, the seat section of the chair is raised relative to the base section by simply oscillating the treadle 107. On each down stroke, the plunger 91 forces the ball 76 in position to close the duct 77 and forces fluid through the hollow core 79 of the sleeve 60, past the ball 81 and, hence, into the bottom of the cylinder 30, thereby raising the ram 33. On each return upstroke of the foot lever, which is effected by the action of coil spring 94, the passageway through the hollow core of the sleeve 60 is closed by the ball 81 and the duct 77 is opened by the inward movement of ball 76 to permit the passage of oil from the reservoir into the space between the sleeve 60 and the bottom of the plunger 91. The necessary air pressure in the reservoir for this purpose is maintained by a vent hole 108 at the top of the cylinder 30 communicating the space above the oil in the reservoir 24 with that in the cylinder 30 above the piston assembly 41.

When it is desired to lower the seat section, the treadle 107 is pressed down to its lowermost position, whereupon the lower end 109 of the plunger 91 contacts the top of the sleeve 60 and forces it downward against the action of the spring 69. When the sleeve 60 is thus downwardly displaced, communication is immediately established between the duct 72 and the duct 73 by passing through the channel provided by the cut out portion of the section 62 at 83. Consequently, the oil under pressure beneath the piston assembly 41 flows through the ducts 72 and 73 into the reservoir chamber 24.

Hence, by the use of a simple lever operating in a

single plane, the seat section can be raised and lowered at will.

The chair is also provided with a swivel clamp as more clearly shown in Figs. 3 and 4. This clamp comprises a plug 110 disposed in an aperture 111 on the side of the collar 53 and a cooperating cam 112 pivotally carried by a bracket 113 attached to the collar. The plug 110 cooperates with two faces 114 and 115 of the cam. One face, say the lower face 115, is at a distance from the pivot axis of the cam to hold the plug 110 firmly against the adjacent surface of the cylinder and hence keep the seat section from rotating relative to the base section. The other face 114 of the cam is at a shorter distance to release the pressure and yet keep the plug 110 from falling out of the hole. The cam 112 is provided with a handle 116 for manually turning it to present one or the other of the faces 114 and 115 to the outer end of the plug 110.

An annular cap 117 overlies the flange portion 54 of the collar 53 at the upper end of the shell 52 to provide a neat finished appearance.

Having thus described my invention, I claim:

1. In a hydraulic chair, a lower section comprising a base having an annular part; an upper annular member vertically spaced from the base; a hollow shell between said member and annular part; means for removably securing said member, base and shell together; means connected to the shell for supporting the chair on a horizontal surface; said base having an upwardly projecting piece containing, relative to the annular part, a concentric hollow portion and an eccentric hollow portion; said base including a wall between said portions; vertical members forming a hydraulic piston cylinder and a hydraulic reservoir; said vertical members being supported by said concentric hollow portion; hydraulic pump means supported by said eccentric portion; said wall having duct means interconnecting said pump, reservoir and piston cylinder; and valve means associated with said duct means for controlling the flow of hydraulic fluid to and from the pump, reservoir and piston cylinder.

2. In a hydraulic chair, a lower section comprising a base having an annular part; an upper annular member vertically spaced from the base; a hollow shell between said member and annular part; means for removably securing said member, base and shell together; chair legs connected to said shell; said base having an upwardly projecting piece containing, relative to the annular part, a concentric hollow portion and an eccentric hollow portion; said base including a wall between said portions; vertical members forming a hydraulic piston cylinder and a hydraulic reservoir; said vertical members being supported by said concentric hollow portion; hydraulic pump means supported by said eccentric portion; said wall having duct means interconnecting said pump, reservoir and piston cylinder; and valve means associated with said duct means for controlling the flow of hydraulic fluid to and from the pump, reservoir and piston cylinder.

3. In a hydraulic chair, a lower section comprising a base having an annular part; an upper annular member vertically spaced from the base; a hollow shell between said member and annular part; means for removably securing said member, base and shell together; chair legs connected to said shell, said legs being adapted to support the shell, base and upper annular member on a horizontal surface; said base having an upwardly projecting piece containing, relative to the annular part, a concentric hollow portion and an eccentric hollow portion; said base including a wall between said portions; vertical members forming a hydraulic piston cylinder and a hydraulic reservoir; said vertical members being supported by said concentric hollow portion; hydraulic pump means supported by said eccentric portion; said wall having duct means interconnecting said pump, reservoir and piston cylinder; and valve means associated with said duct means

5

for controlling the flow of hydraulic fluid to and from the pump, reservoir and piston cylinder; a pump treadle on the exterior of the shell, a link supporting the treadle at one end, means pivotally supporting the other end of the lever on the base, said shell having apertures, said lever extending through said apertures from the exterior to the interior of the shell.

References Cited in the file of this patent

UNITED STATES PATENTS

1,046,145 Budesheim ----- Dec. 3, 1912

1,212,757
1,454,524
1,491,685
1,586,752
1,720,434
1,767,124
1,904,115
1,951,508
2,059,130
2,613,725

5

10

6

Freese ----- Jan. 16, 1917
Sunderman ----- May 8, 1923
Eicher et al. ----- Apr. 22, 1924
Koenigkramer ----- June 1, 1926
Pedersen ----- July 9, 1929
Flanagan ----- June 24, 1930
Bacon ----- Apr. 18, 1933
Emmert ----- Mar. 20, 1934
May ----- Oct. 27, 1936
Woodhall ----- Oct. 14, 1952